

Claims:

1. A control element for pressure media, for example a pneumatic valve or a hydraulic valve, with a valve body having one or a plurality of channels arranged therein, and with at least one moving element arranged in a channel, and with means for the relative movement between the moving element and the valve body, characterized in that the means (30) are arranged in the valve body and act directly or indirectly on the moving element (11).
2. The control element according to claim 1, characterized in that the means (30) is formed by a wave energy source (71) and/or a wave generator (72).
3. The control element according to claim 1 and/or 2, characterized in that the means (30) is formed by a heating device (35).
4. The control element according to one or several of the preceding claims, characterized in that the means (30) is formed by an elastically deformable transmission element (31) and a heating device (35).
5. The control element according to one or several of the preceding claims, characterized in that the means (30) is formed by at least one coil (174).

6. The control element according to one or several of the preceding claims, characterized in that the elastically deformable transmission element (31) forms a moving element (11).

7. The control element according to one or several of the preceding claims, characterized in that the transmission element (31) completely defines at least one inner space (33).

8. The control element according to one or several of the preceding claims, characterized in that a rapidly evaporating liquid is arranged in the inner space (3), in particular in a chamber (92) forming said inner space.

9. The Control element according to one or several of the preceding claims, characterized in that the heating device (35) is arranged in the inner space (33) and/or on an outer surface (34) of the transmission element (31) facing away from said inner space.

10. The control element according to one or several of the preceding claims, characterized in that the heating device (35) is formed by one or several heating elements (36), in particular heating resistors (37).

11. The control element according to one or several of the preceding claims, characterized in that a channel (8) is

associated with each heating element (36) and/or each transmission element (31) or each chamber (92) of a transmission element (31).

12. The control element according to one or several of the preceding claims, characterized in that the moving element (11) is made from metal and/or plastic in the form of a piston.

13. The control element according to one or several of the preceding claims, characterized in that the moving element (11) has different coefficients of thermal expansion by sections.

14. The control element according to one or several of the preceding claims, characterized in that moving elements (11) disposed adjacent to one another are movable in relation to each other.

15. The control element according to one or several of the preceding claims, characterized in that the moving element (11) has at least one sealing element (22), for example a sealing layer (163) or a sealing ring.

16. The control element according to one or several of the preceding claims, characterized in that the means (30) is formed by one or a plurality of coils (174), said coils being arranged in one or a plurality of channels (8), in particular in the

distribution channel (12), in which the moving element (11) is preferably arranged.

17. The control element according to one or several of the preceding claims, characterized in that a distribution channel (12) for the medium forming a channel (8) forms or has a guide device (10) for the moving element (11).

18. The control element according to one or several of the preceding claims, characterized in that the guide device (10) is formed by a bolt (188) projecting through a bore of the moving element (11).

19. The control element according to one or several of the preceding claims, characterized in that the bolt (188) has deepening grooves (224) extending concentrically around the center axis (9) and being spaced in the direction of the center axis (9) by a spacing (229), with contact elements (230) being arranged in said deepening grooves.

20. The control element according to one or several of the preceding claims, characterized in that the contact elements (230) have contact bridges (231), the latter projecting into an inner bore (233) of the bolt (188) and being line-connected via line elements (238) to a multiple plug (241) arranged on a flange plate (222) of the closing element (40).

21. The control element according to one or several of the preceding claims, characterized in that contact elements (242) for contacting the means (30) are arranged on an inner surface (187) of the flange plate (222).

22. The control element according to one or several of the preceding claims, characterized in that the moving element (11) is formed by a liquid, the latter being forcible guided in a cage-like housing (65) arranged in the distribution channel (12).

23. The control element according to one or several of the preceding claims, characterized in that the moving element (11) is connected with a closing element (40), the latter being detachably and with torsional strength arranged in the distribution channel (12).

24. The control element according to one or several of the preceding claims, characterized in that the moving element (11) and/or the means (30) are formed by a multi-layered element (158) having elastically deformable, tongue-shaped elements (159).

25. The control element according to one or several of the preceding claims, characterized in that the distribution channel (12) has a groove (185) in which the transmission element (31) and/or the means (30) are arranged.

26. The control element according to one or several of the preceding claims, characterized in that the moving element (11) has concave moldings (205) in a zone facing the groove (185).

27. The control element according to one or several of the preceding claims, characterized in that the moving element (11) is formed by a diaphragm (272).

28. The control element according to one or several of the preceding claims, characterized in that at least a part zone of a holding and/or locking device (59) for the moving element (11) is arranged in a channel (8), in particular in a distribution channel (12).

29. The control element according to one or several of the preceding claims, characterized in that the holding and/or locking device (59) has a heating device (35) extending concentrically around the center axis (9), said device consisting of a plurality of heating elements (36) successively arranged in the circumferential direction of an inner surface (60) of the distribution channel (12), with an inner space (33) of a cover (32) filled with a high-boiling liquid being associated with each of said heating elements.

30. The control element according to one or several of the preceding claims, characterized in that two inner spaces (33) of

the heating device (35) extending concentrically around the center axis (9), said inner spaces opposing each other diametrically, are simultaneously expanded in each case, and that the part zones of the cover (32) associated with said inner spaces (33) engage holding grooves (58) of the moving element (11).

31. The control element according to one or several of the preceding claims, characterized in that the control element (1) has a basic body (97) in which one or a plurality of channels (8) are arranged in the form of a grid, said channels forming in the zone of the top side (3) openings (103) which are covered by at least one collecting element (99) having at least one connection opening (112).

32. The control element according to one or several of the preceding claims, characterized in that the connection opening (112) reaches up to a groove-like deepening (104) of the collecting element (99) covering the openings (103).

33. The control element according to one or several of the preceding claims, characterized in that the means (30), in particular the heating device (35) has a base plate (114) on whose top side (122) the heating elements (36) are arranged particularly in the form of a grid.

34. The control element according to one or several of the preceding claims, characterized in that the base plate (114) has a face element (127) having at least one coupling receptacle (130) of a coupling device (131).

35. The control element according to one or several of the preceding claims, characterized in that lines (133) lead from the coupling receptacle (130) to the heating elements (36), said lines being realized in the form of conductor paths (134) at least in the zone of the top side (122).

36. The control element according to one or several of the preceding claims, characterized in that the moving element (11) is realized in the form of a lifting piston (140), the latter being arranged in a channel (8) and having a sealing section (141) formed by a cone jacket (143), with a sealing seat (156) arranged in the channel (8) being associated with said sealing section.

37. The control element according to one or several of the preceding claims, characterized in that the lifting piston (140) has a tie rod (151), the latter being defined by a transmission element (31) formed by a cover (32) with high-boiling liquid and forming a moving element (11); and that the tie rod projects through a spring element (154) exerting a spring force on a dish



element (155) detachably or undetachably connected with the tie rod (151).

38. The control element according to one or several of the preceding claims, characterized in that the transmission element (31) formed by the cover (32) and forming a moving element (11), upon heating of the high-boiling liquid defined by said cover, exerts a force of pressure directed against the spring force of the spring element (1549) on a collar (14) detachably or undetachably connected with the lifting piston (140).

39. The control element according to one or several of the preceding claims, characterized in that the distribution channel (12) is divided in several distribution sections (178) by at least one sealing partition, and that in each case two adjacent means (30) in particular two adjacent coils (174) of two distribution sections (178) are spaced from each other by a distance (183), said distance being greater than a spacing (184) between of a coil (174) and a collar (20) of the moving element (11) associated with said coil, said distance being measured parallel with said spacing.

40. The control element according to one or several of the preceding claims, characterized in that the moving element (11) has locking grooves (251) having locking elements (252) of holding and/or locking devices (59) associated therewith.

41. The control element according to one or several of the preceding claims, characterized in that the locking element (252) has a locking pin (258), the latter being enveloped by a cover (32) of a transmission element (31) and having a plate (263) spacing the transmission element (31) from a spring element (268).

42. The control element according to one or several of the preceding claims, characterized in that the plate (263) spaces a piezo-element (271) from the spring element (268).

43. The control element according to one or several of the preceding claims, characterized in that the moving element (11) is realized in the form of a lifting piston (140) having a locking collar (312) with a locking element (252) being associated with said collar, said locking element having slots (303) arranged around a lifting piston axis (275) of the lifting piston (140) in the form of a star, said slots spacing spring projections (306) arranged in the form of star from each other.

44. A means for the relative movement and/or deformation of moving elements arranged in one or a plurality of channels, in particular for pneumatic valves, characterized in that the means (30) is formed by a wave energy source (71) and/or a wave generator (72) and/or a transmission element (31) defining an

inner space (33), in which a rapidly evaporating liquid is arranged, and/or by a heating device (35) and/or by a coil (174).

45. A moving element for a control element, in particular according to one or several of the preceding claims, for example for a pneumatic valve or a hydraulic valve, said moving element being arranged in at least one channel of a valve body of the control element, characterized in that the moving element (11) is realized in the form of an elastically deformable diaphragm (272) arranged in a channel (8), in particular in the distribution channel (12).

46. The moving element according to claim 45, characterized in that the diaphragm (272) has a stretched length measured from a face (273) that is greater than the length (90) of the distribution channel (12) measured from the face (273) and extending parallel with said length.

47. The moving element according to claim 45 and/or 46, characterized in that the diaphragm (272) has top sides (162) facing away from each other, said top sides preferably having sealing layers (163), with the openings (91) of the secondary channels (18) being associated with said sealing layers in the zone of the surfaces (38).

48. The moving element according to one or several of the preceding claims, characterized in that means (30) for the relative movement between the moving element (11) and the valve body, in particular coils (174) and/or flat coils (274) are arranged in the distribution channel (12).

49. The moving element according to one or several of the preceding claims, characterized in that the flat coils (274) are arranged in the zone of the surfaces (88) and associated with the top sides (162), and preferably also have openings (274) preferably in the zone of the opening (91).

50. The moving element according to one or several of the preceding claims, characterized in that high-intensity current is briefly admitted to the coils (174) or flat coils (274).

51. A method of generating a relative movement between moving elements and a valve body of a control element, whereby a force is exerted on the moving element, characterized in that the force is exerted by a pressure pulse preferably generated in a control element according to one or several of claims 1 to 43.

52. The method according to claim 51, characterized in that the pressure pulse is generated by heating a pressure medium.

53. The method according to claim 51 and/or claim 52, characterized in that the pressure pulse is generated by a brief current pulse of high current intensity.

54. The method according to one or several of the preceding claims, characterized in that the moving element is acted upon by several pressure pulses successively generated in the direction of feed of the moving element.